B&P File No. 11096-6

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Title: **FOLDABLE STORAGE CONTAINER**

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FOLDABLE STORAGE CONTAINER:

FIELD OF THE INVENTION

[0001] The present invention relates to storage containers, and in particular to foldable storage containers.

BACKGROUND OF THE INVENTION

[0002] Boxes or storage containers are commonly used to store a wide variety of household, medical and commercial materials. These materials may include unsanitary or harzardous wastes which, if disturbed when being disposed of, may cause environmental or health concerns.

[0003] Another use for storage containers is to store pet wastes. These pet wastes are typically mixed with an absorbent granular material. These pet litter containers must be regularly emptied to reduce the occurrence of odours and to combat the spread of bacteria and allergens. Emptying a litter container either requires the transfer of the granular material into a waste receptacle, or the removal of the waste particles.

[0004] Numerous storage containers have been developed to store and dispose of waste materials, such as pet wastes. Many of these storage containers are commercially available in a pre-formed, rigid box shape. These box-shaped containers can be cumbersome and costly to ship. Furthermore, such containers serve only as an inexpensive and disposable replacement of the litters trays. If used for prolonged periods of time without being replaced, these containers may deteriorate and fracture causing the waste material to be strewn about the household or workplace.

[0005] To prevent the release of waste materials, several storage containers which fold from a tray position to a closed box position are known. Unfortunately, many of these storage containers consist of hinged panels and channels that become obstructed by the waste material, thereby preventing

the storage containers from being completely closed. To close these storage containers, a user may have to touch the waste material in order to remove the obstructions.

[0006] Accordingly, there is a need for an improved foldable storage container which allows for more convenient storage and disposal of waste materials.

SUMMARY OF THE INVENTION

[0007] The subject invention is directed to a storage container that is foldable between a first, second and third position. The storage container has a generally planar base, a pair of opposing end panels, and a pair of opposing side panels. The base includes a bottom portion located between a pair of base panels. In the first position, the side panels and end panels are folded to form a generally planar shape. When formed into the second position, the end and side panels are folded generally perpendicular to the base to form an open container shape. In the third position, the base panels, side panels and end panels are folded to form a closed box shape. The end panels are foldably connected to the base panels. The side panels are foldably connected to the base and the end panels.

[0008] The subject invention is also directed to a storage container comprising a generally planar base, a pair of opposing end panels, and a pair of opposing side panels. The base includes a bottom portion and a pair of base panels foldably connected to the bottom portion. The bottom portion is located between each of the pair of base panels. The pair of opposing end panels are foldably connected to the base panels. The pair of opposing side panels are foldably connected to the base and end panels. Each pair of side panels defines a channel therein. The channel slidably receives a tab at each end thereof. The tab is connected to the base panel and is adapted to position the side panel in a generally upright position when the end panels and base panels move between an open position and a closed position.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] For a better understanding of the present invention, and to show more clearly how it may be carried out in practice, reference will now be made, by way of example only, to the accompanying drawings, in which:

[0010] Fig. 1 is a perspective view showing a storage container according to a preferred embodiment of the present invention in a generally planar position;

[0011] Fig. 2 is a perspective view of the storage container in an open container position;

[0012] Fig. 3 is a perspective view of the storage container in a closed box position;

[0013] Fig. 4 is a perspective view of the blank used to make the storage container;

[0014] Fig. 5 is a perspective view of the blank illustrating a step A for forming the blank into the storage container;

[0015] Fig. 6 is a perspective view of the blank illustrating a step B for forming the blank into the storage container;

[0016] Fig. 7 is a partial perspective view of a channel formed by side panels of the storage container;

[0017] Fig. 8 is a perspective view of the blank illustrating steps C, D and E for forming the blank into the storage container;

[0018] Fig. 9 is a partial perspective view of a corner panel of the storage container;

[0019] Fig. 10 is a partial top view of the corner panel illustrating steps F, G and H for forming the storage container into a generally planar position;

[0020] Fig. 11 is a partial perspective view of the corner panel illustrating steps J, J' and K for forming the storage container into a closed box position;

[0021] Fig. 12 is a partial perspective view of the corner panel illustrating a step L for forming the storage container into a closed box position;

[0022] Fig. 13 is a partial perspective view of the storage container showing the channel receiving a tab;

[0023] Fig. 14 is a partial perspective view of the storage container showing the channel receiving a tab of greater thickness in accordance with an alternate embodiment of the present invention;

[0024] Fig. 15 is a plan view of the tab of Fig. 14;

[0025] Fig. 16 is a perspective view of the storage container in a generally planar position storing a granular material and sealed with a plastic material;

[0026] Fig. 17 is a perspective view of the storage container in an open container position storing the granular material; and

[0027] Fig. 18 is a perspective view of the storage container with the granular material in a closed box position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0028] Reference is made to Figs. 1, 2 and 3 which illustrate a storage container **10** made in accordance with a preferred embodiment of the present invention. The storage container **10** comprises a base **12**, a pair of opposing side panels **14**, and a pair of opposing end panels **16**. The storage container **10** is foldable between a first, second and third positions, as shown in Figs. 1, 2 and 3, respectively. The first position is also referred to as the "generally

planar position", the second position is also referred to herein as the "open position", and the third position is referred to as the "closed position".

[0029] In the first position shown in Fig. 1, the storage container **10** has a generally planar shape that is particularly suitable for shipping and stacking purposes. When folded into the second or open position shown in Fig. 2, the side panels **14** and the end panels **16** of the storage container **10** are folded generally perpendicular to the base **12** to form an open container. In the third or closed position shown in Fig. 3, the base **12**, side panels **14** and end panels **16** of the storage container **10** are folded to form a closed box, as described in detail below. The storage container **10** may include a pair of opposing handle panels **18** connected to the end panels **16** to facilitate the carrying of the container.

[0030] The storage container **10** may be used to store a wide variety of materials and tools, such as, for example, granular and flowable materials, saw dust, plaster, gardening and medical implements. In a preferred embodiment, the storage container **10** is used to store cat litter.

[0031] In a preferred embodiment of the present invention, the storage container **10** is made from a cardboard material, such as corrugated or non-corrugated cardboard. It will be understood by those skilled in the art that the storage container **10** may be made from any other suitable material such as, for example, plastic, paperboard, and multi-layered laminated paper. The storage container **10** may also have water resistant and anti-bacterial characteristics to prevent the leakage of moisture from the container and to limit contamination.

[0032] The storage container **10** is preferably formed from a cardboard blank **20** illustrated in Fig. 4. Referring to Figs. 2 and 4, the base **12** of the storage container **10** forms a generally planar surface having a pair of base panels **21** and a bottom portion **22** located between each of the pair of base panels **21**. The base panels **21** are foldably connected to the bottom portion **22** along a pair of centre fold lines **24** to define the generally rectangularly shaped base **12**. As will be illustrated, the centre fold lines **24** enable the

storage container **10** to be folded from the second position to the third position.

[0033] Referring to Fig. 4, each of the side panels **14** comprises an outer panel **26**, an inner panel **28** and a pair of corner panels **30**. Each outer panel **26** is foldably connected to the bottom portion **22** along a first side fold line **32**. The first side fold lines **32** enable the storage container **10** to be folded from the first position to the second position. The inner panel **28** of each side panel **14** is foldably connected to the outer panel **26** along double fold line **34**. The inner panel **28** is also foldably connected to the corner panels **30** along a pair of opposing fold edges **36**. Each corner panel **30** includes a base flap **37** and an end flap **38** which are foldably connected to a pivot panel **39** along a flap fold line **40**.

[0034] The end panels **16** are foldably connected to the base panels **21** along a pair of end fold lines **42**. The end fold lines **42** enable the storage container **10** to be folded from the first position into the second position. The end panels **16** have an outer edge **44** which is foldably connected to the handle panels **18** to enable the handles to be pivoted for use when transporting the storage container **10**.

[0035] The handle panels **18** may have various configurations and shapes to facilitate the carrying of the storage container **10**. The handle panel **18** may include a main handle **46** and a pair of opposing handle reinforcing portions **48** foldably connected to the main handle **46** along handle edges **47**. For applications involving the storage of lightweight materials, the handle panel **18** may consist of only the main handle **46**. For the carriage of heavier materials, the handle panel **18** may comprise of two main handles **46** which are foldably connected to form a sturdy support for carrying the storage container **10**.

[0036] Continuing to refer to Fig. 4, the storage container **10** further comprises four tabs **50** which are detachably connected to the blank **20**. Each tab **50** has an attachment portion **52** and an insert portion **54** which assist in the folding of the storage container **10** from the first position to the

second position, as described in detail below. The attachment portion **52** is foldably connected to the insert portion **54** along a tab fold line **56**. The insert portion **54** is further provided with a crease line **58** to facilitate the positioning of the storage container **10** into the third position, as will be discussed in greater detail below.

[0037] Reference is now made to Figs. 5, 6, 7 and 8 which illustrate the steps of forming the blank **20** into the second position of the storage container **10**.

[0038] Fig. 5 shows step A in the formation of the storage container **10**. The handle panel **18** is formed by folding the reinforcing handle portions **48** about the handle edges **47** onto the main handle **46** (shown in Fig. 4). The reinforcing handle portions **48** may be secured to the main handle **46** using any suitable adhesive or fastener.

[0039] The four tabs **50**, (shown shaded in Fig. 5), are detached from the blank **20** along a tear line **59**. The attachment portions **52** of the tabs **50** are then adhered to the underside of each of the base panels **21** proximate to the four corners of the base **12**. The insert portions **54** extend outwardly from the base panels **21**. The tab fold line **56** is oriented generally parallel to the first side fold line **32**.

[0040] Referring to Fig. 6, the side panels **14** are formed by hingedly folding the inner panels **28** about the double fold lines **34**, as shown at step B. A pair of securement panels **60** foldably connected to the inner panels **28** along a pair of second side fold lines **62** are positioned on the upper side of the bottom portion **22** of the base **12**. The base flaps **37** of the corner panel **30** are positioned on the upperside of the base panels **21**. The securement panels **60** and base flaps **37** may be secured to the bottom portion **22** and base panels **21**, respectively, using any suitable adhesive or fastener.

[0041] Referring to Fig. 7, a channel **66** is defined between the inner panel **28** to the outer panel **26** of each side panel **14**. The insert portion **54** of the tabs **50** is received in the channels **66**. Each of the channels **66** has a

first end **68** and a second end **70** which are open. The first and second ends **68** and **70** of the channels **66** receive the corresponding tabs **50** adjacent thereto.

[0042] Referring to Fig. 8, the side and end panels **14** and **16**, respectively are folded generally perpendicular to the base **12** to form the second position of storage container **10** (shown in Fig. 2). At step C, the end flaps **38** of the corner panels **30** are folded generally perpendicular to the side panel **14** around the flap fold line **40**. The side panels **14** are then folded generally perpendicular to the base **12** about the first and second side fold lines **32** and **62**, as shown at step D. The end panels **16** may then be folded generally perpendicular to the base **12** to intersect the side panels **14** at a generally right angle in each of the corners and to form the open position in accordance with a preferred embodiment of the present invention. The end flaps **38** of corner panels **30** may be secured to the end panels **16** to stabilize the storage container **10** and to minimize leakage from the corner areas.

[0043] From the open position shown in Fig. 2, the storage container may be folded into either the generally planar position or the closed position.

[0044] Referring to Fig. 9, the positioning of the storage container **10** into the first, second and third positions is achieved using the pivot panel **39**. The pivot panel **39** preferably has a first sub panel **72**, a second sub panel **74**, a third sub panel **76**, a fourth sub panel **78** and a fifth sub panel **80**. The sub panels **72**, **74**, **76**, **78** and **80** may be provided with score lines **81** to enable the sub panels **72**, **74**, **76**, **78** and **80** to bow or bend as the storage container **10** is folded into the first, second and third positions.

[0045] The sub panels **72**, **74**, **76**, **78** and **80** are foldably connected along one or more of a first crease line **82**, a second crease line **84** and a bisecting crease line **86**. The first and second crease lines **82** and **84** extend diagonally across the pivot panel **39** and intersect with the bisecting crease line **86** at a point **88** that is generally in the centre of the pivot panel **39**. The lines **82**, **84** and **86** are adapted to enable the sub panels **72**, **74**, **76**, **78** and **80** to be folded relative to one another so as to allow the storage container **10**

to be inwardly or outwardly closed upon itself into the first, second or third positions.

[0046] Reference is made to Fig. 10 which illustrates the positioning of the storage container from the open position (of Fig. 2) to the generally planar position of Fig.1). At step F, the first, fourth and fifth sub panels **72**, **78** and **80** are collapsed inwardly and downwardly about the first crease line **82** onto the underlying second and third sub panels **74** and **76**. When fully collapsed, the first, fourth and fifth sub panels **72**,**78** and **80** will be in an overlying relationship with the second and third sub panels **74** and **76**. The inward movement of the first, fourth and fifth sub panels **72**, **78** and **80** causes the side panels **14** to fold outwardly away from the base **12** about the first and second side fold lines **32** and **62**, as shown at step G in Fig. 10. The insert portions **54** of the tabs **50** also fold outwardly about the tab fold lines **56** (not shown). The movement of the first, fourth and fifth sub panels **72**, **78** and **80** further causes the end panels **16** to fold inwardly about the end fold lines **42** towards the base panels **21** (not shown in Fig. 10) of the base **12**, as shown at step H. In this manner, the storage container **10** is folded into a generally planar shape suitable for stacking and shipping purposes.

[0047] Reference will now be made to Figs. 11, 12 and 13 which show the steps of positioning the storage container from the open position to a closed position. Referring to Fig. 11, a point **88** is pressed inwardly causing the sub panels **72** and **80** to collapse in the directions J and J' around the bisecting line **86**. The movement of the point **88** causes the sub panels **76** and **78** to fold inwardly about the flap fold lines **40**. As the point **88** is pressed further inwardly, the base panels **21** rotate toward each other around the centre fold lines **24**, as shown at step K.

[0048] Referring to Fig. 12, the sub panels **72** and **80** continue to collapse upon each other as bisecting line **86** and sub panel **80** together rotate around and beyond the sub panel **72**, as shown at step L. The base panels **21** are now positioned generally perpendicular to the bottom portion

22. The end panels **16** are positioned generally parallel to and spaced apart from the bottom portion **22**.

[0049] Once the storage container **10** has been folded into the closed position (shown in Fig. 3), the opposing handle panels **18** may be closed and clasped together to enable the storage container **10** to be carried. The handle panels **18** may be provided with interlocking or engaging notches (not shown) to help keep the panels clasped together. The notches may be formed in a V-shape defined by perforated edges provided on the blank **20**. Any other suitable notch shape may be used to secure the handle panels.

[0050] As best shown in Fig. 7 and 13, the movement of the end panels **16** and base panels **21** around the centre fold lines **24** (not shown) causes the insert portion **54** of the tab **50** to slide into the corresponding ends **68** and **70** of the channels **66**. The insert portions **54** maintain the side panels **14** in a generally upright position relative to the bottom portion **22** as the end and base panels **16** and **21**, respectively, are moved into the closed position. The insert portions **54** of the tabs **50** have a leading edge **83** which is designed to minimize resistance as the insert portion **54** is received into the channel **66**. The leading edge **83** is also designed to contact the first and second fold lines **32** and **62** to prevent over rotation of the base panels **21** beyond the closed position.

[0051] The crease line **58** provided on the tab **50** enables the insert portion **54** to bow or bend as it received within the channel **66**. The bowing or bending action maintains the leading edge of the insert portion **54** in alignment with the longitudinal axis of the channel **66**. The insert portions **54** of the tabs **50** have a round contour which is designed to minimize resistance as the tab **54** is received into the channel **66**.

[0052] Referring to Fig. 14, in an alternative embodiment, tabs **150** may be provided with increased thickness so as to provide greater support for the side panels **14**. As shown in Fig. 15, the tabs **150** may comprise a first tab **82** and a second tab **84** foldably connected along a mirror line **86**. The first tab **82** has a first insert portion **88** and a first attachment portion **90** which foldably

mate with a second insert portion **92** and a second attachment portion **94** forming the second tab **84**. The tabs **82** and **84** may be secured together using a suitable adhesive or fastener. It is understood that the mirror line **86** may be located along any edge of the tab **150** so as to permit the first tab **82** to foldably mate with the second tab **84**.

[0053] The use and operation of the preferred embodiment will now be described with reference to Figs. 16–18.

[0054] Referring to Figs. 1 and 16, the storage container **10** is folded into the first position as described above and sealed with a shrink wrap material **92** or any other suitable material for maintaining the storage container **10** in a generally planar shape. In this configuration, the storage container **10** assumes a generally planar shape that is suitable for shipping purposes and placing in a store display. Prior to use, the shrink wrap material **92** is removed from the storage container **10**.

[0055] Referring now to Figs. 2 and 17, the side panels **14** are folded inwardly until being positioned generally perpendicular to the base **12**. The end panels **16** are simultaneously folded outwardly so as to be generally perpendicular to the base **12**, thereby forming the open position container. A layer of granular material **90** for cat litter is dispersed across the base **12** of the storage container **10**.

[0056] Referring now to Figs. 2 and 18, once the granular material **90** has been used, the storage container **10** is folded into the closed position (as described above) for disposal or storage purposes. The movement of the base panels **21** into a generally vertical position causes the granular material **90** to travel away from the collapsing corner panels **30** and to collect on and above the bottom portion **22**. Accordingly, the full closure of the storage container **10** into the third position is not impeded by the presence of granular material **90** trapped adjacent to the corner panels **30**, bottom portion **22**, base panels **21** and/or side panels **14**.

[0057] Referring to again Figs. 7 and 14, the insert portions **54** of the tabs **50** slide in channels **66** to maintain the side panels **14** generally upright in relation to the bottom portion **22**. This provides the advantage of reducing the likelihood of kitty litter **90** spilling out of the storage container **10** during folding thereof between the second (open container) and third (closed box) positions.

[0058] The handle panels **18** may then be pivoted into a generally vertical position and clasped together to enable the storage container **10** to be carried to the disposal or storage site.

[0059] While what has been shown and described herein constitutes a preferred embodiment of the subject invention, it should be understood that various modifications and adaptions of such embodiment can be made without departing from the present invention, the scope of which is defined in the appended claims.